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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,764	03/31/2004	Bo Huang	42P18121	5246
8791 7590 09/24/2007 BLAKELY SOKOLOFF TAYLOR & ZAFMAN 1279 OAKMEAD PARKWAY SUNNYVALE, CA 94085-4040			EXAMINER KANG, INSUN	
			ART UNIT 2193	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/813,764

Applicant(s)

HUANG ET AL.

Examiner

Insun Kang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 6-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 June 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. This action is in response to the amendment filed on 6/25/2007.
2. As per applicant's request, claims 1-5 have been cancelled and claims 6, 8, 11, 13, 16, and 18 have been amended.
3. Claims 6-20 are pending in the application.

### ***Claim Rejections - 35 USC § 101***

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 6-10 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 6-10 are non-statutory because they are directed to an apparatus comprising a "machine-readable medium" that includes a propagated medium such as a carrier wave and a signal as recited in the instant specification (i.e. "The machine-readable medium includes any mechanism that ...transmits...information," page 12). Such medium does not have a physical structure, rather it is the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism per se. Moreover, it does not fit within the definition of the categories of patentable subject matter set forth in § 101. Therefore, the claims are non-statutory. It is recommended to change the term as a computer-storage medium.

The following link on the World Wide Web is for the United States Patent And Trademark Office (USPTO) policy on 35 U.S.C. §101. The following link on the World

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Wide Web is for the United States Patent And Trademark Office (USPTO) policy on 35 U.S.C. §101.

[http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101\\_20051026.pdf](http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101_20051026.pdf)

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 8-10, 13-15, and 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Per claims 8, 13, and 18:

It is unclear to what the class assignment map is related. It is interpreted as: a register class assignment map for assigning the second register class.

It is unclear how entry and exit of each instruction are related to the block entry and exit. It is interpreted as: entry and exit of each instruction in the block.

It is unclear as to which register class assignment map they are referring in lines 2, 3, and 5 of the body of the claims. They are interpreted as: the register class assignment map.

Per claims 9, 14, and 19, it is unclear as to which register class fixups they are referring in the body of the claims. They are interpreted as: the register class fixups.

Per claim 20, there is insufficient antecedent basis for the limitation “the system” in line 1. It is interpreted as: the computer.

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As per claims 10 and 15, these claims are rejected for dependency on the above rejected parent claims.

\*Note: The above rejections were previously presented but the applicant has not responded. Therefore, the rejection is represented.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 6-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hopkins et al. (US Patent 4,961,141) hereafter referred to as "Hopkins" in view of Auslander et al. ("Fast, Effective Dynamic Compilation," ACM, page 149-159, 1996).

Per claim 6:

Hopkins discloses:

- assigning a first register class to at least one symbolic register in at least one instruction (i.e. "for each equivalence class, forming the logical OR function of register usage information for all symbolic registers in the class," col. 1 lines 55-60; "initializing in function block 27...i is set equal to the first register," col. 4 lines 21-34)

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- assigning a second register class to the at least one symbolic register (i.e. after step 34 in Fig 4, i+1 is set back to FIRST REG which assigns the i+1 to the symbolic register);

Hopkins does not explicitly teach conjunctive forward dataflow analysis.

However, Auslander teaches it was known in the pertinent art, at the time applicant's invention was made, to evaluate as false as long as one of its conjunctive clauses evaluates as false (i.e. page 152, second paragraph, lines 1-11). It would have been obvious for one having ordinary skill in the art to modify Hopkins' disclosed system to incorporate the teachings of Auslander. The modification would be obvious because one having ordinary skill in the art would be motivated to reduce the register assignment sets by assigning a register class only if the conjunctive clause is true as suggested by Auslander (i.e. page 152, left col., paragraph 2-3).

Hopkins further discloses:

- reducing register class fixups for the assignment of the second register class (i.e. "dead code in the program is removed in block 6," col. 2 lines 50-60; "fix up code is inserted...move the value from one space to another," col. 3 lines 33-44);
- renaming the at least one symbolic register (i.e. "If so, new names are made up in function block 39 so that there is a different name for each context," col. 4 lines 41-44).

Per claim 7:

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Hopkins further discloses:

- said assigning the first register class is an initial assignment (i.e. “SET i = FIRST REG,” Fig 4A).

Per claim 8:

Hopkins further discloses:

- marking a register class assignment map at a block entry (i.e. “i is set equal to the first register,” which is a block entry initializing the function block; col. 4 lines 21-25; see also Fig 4 the loop block);
- marking a register class assignment map at a block exit (i.e. see Fig 4, in function block 34, i is indexed by adding one to i before looping back to decision block 28; “in the decision block 25, a test is made to determine if there are any more operations to be processed...otherwise, control passes to the interlude logic,” which sets i to N (exit point) after the final loop, col. 4 lines 15-19)
- determining a register class assignment map at an entry of each instruction (i.e. ; “a test is made in decision block 28 to determine if i is less than or equal to the last register,” col. 4 lines 21-34; the decision blocks 28 and 29 are performed at an entry point i)
- determining a register class assignment map at an exit of each instruction (i.e. ; “a test is made in decision block 28 to determine if i is less than or equal to the last register,” col. 4 lines 21-34; the decision blocks 28 and 29 are performed at an exit point where i is set to N (exit point) after the final loop).

Per claim 9:

Hopkins further discloses:

- hoisting and sinking register class fixups (i.e. “fix up code is inserted...move the value from one space to another,” col. 3 lines 33-44);
- and removing unnecessary register class fixups (i.e. “dead code in the program is removed in block 6,” col. 2 lines 50-60).

Per claim 10:

Hopkins further discloses:

- removing dead code (i.e. “dead code in the program is removed in block 6,” col. 2 lines 50-60).

Per claims 11-15, they are the system versions of claims 6-10, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 6-10 above.

Per claims 16-20, they are the computer versions of claims 6-10, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 6-10 above.

### ***Response to Arguments***

10. Applicant's arguments with respect to claims 6-20 have been considered but are moot in view of the new ground(s) of rejection.



***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Insun Kang whose telephone number is 571-272-3724. The examiner can normally be reached on M-F 8:30-5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MENG AI AN can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published

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applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

I. Kang  
AU 2193

  
MENG-AT-LAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100